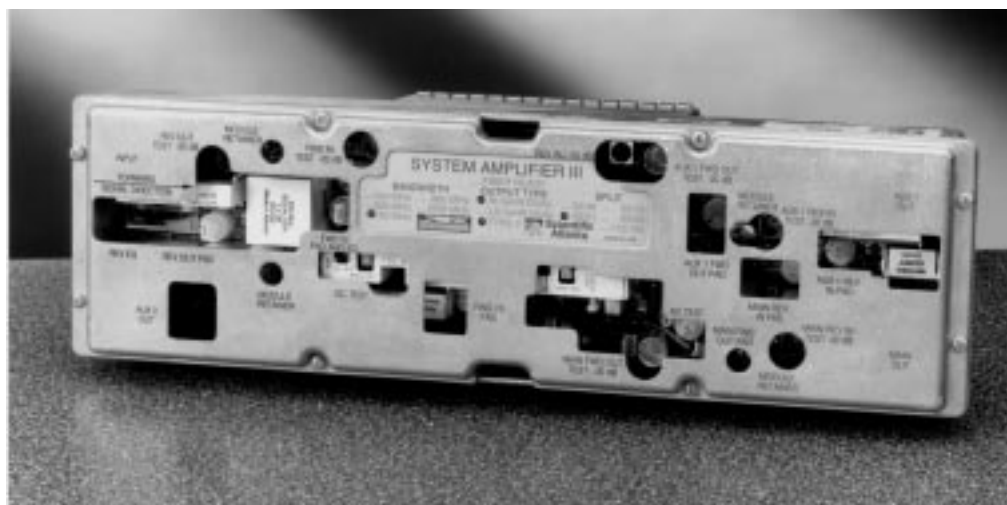


System Amplifier III — Type 2A-3 High Gain Dual (3 Output Version) 750 MHz with 40/52 MHz Split



22891

DESCRIPTION

The Type 2A-3 RF amplifier module offers a high performance design solution for the latest HFC networks.

This amplifier module comes pre-configured with interstage equalizer, diplexers, reverse amplifier, and AGC module, in order to achieve optimum station performance. Additionally, maximum flexibility in reverse signal path alignment is achieved via individual reverse testpoints and plug-in pads for each of the reverse inputs.

The Type 2A-3 amplifier module is a High Gain Dual amplifier which provides two high level outputs, with the ability to split one of the outputs to feed a third output port.

FEATURES

- 60 and 90 V AC powering capability
- 15 ampere current capacity (steady state) and 25 ampere surge survivability
- Integrated reverse amplifier, with optimized diplex filter group delay for forward and reverse paths
- Individual reverse input testpoints and input pads for both the Main and Aux reverse inputs allowing optimum reverse path alignment
- Improved station frequency response
- Unitized design (amplifier and power supply in a single module) enabling simplified and faster maintenance
- High efficiency, transformerless power supply lowering system operating cost
- Directional Coupler RF testpoints provide optimum accuracy
- Surge Resistant™ Circuitry ensures hybrid protection without fuses or other nuisance failure-causing devices



The diagram illustrates the internal signal processing of the T6022 receiver. It features several input and output ports, each with a fuse shunt and an AC bypass switch. The main signal path starts at the 'Input' port, which can be bypassed or routed through a 'FWD' or 'REV' switch. The 'Forward' path includes an EQ, a Pad, an HPF, a TRIM, an AGC, an ISEQ, and an AGC Coupler. The 'Reverse' path includes a Pad, a Rev EQ, and an LPF. The 'Main' output path includes a Main Pad, a Rev Pad, and a Main Pad. The 'Aux 1' and 'Aux 2' ports also have bypass switches and are connected to the main signal path. The diagram shows the flow of signals between these components, including the use of pads and switches to manage signal levels and routing.

TYPE 2A-3 SYSTEM AMPLIFIER III – 5-40/52-750 MHz

General Station Performance Data ¹

	Units	Forward	Reverse
Pass Band	MHz	52-750	5-40
Amplifier Type	---	PHD	PP
Operational Temperature Range	degrees	-40 to +140 F	-40 to +140 F
Frequency Response	dB	±0.5	±0.5
Auto Slope & Gain Range	dB	±4	N/A
Return Loss	dB	16	16
Operational AC Through Current	Amps	15	N/A
Max AC Through Current (2 hrs)	Amps	25	N/A
Hum Modulation @ 10 A	dB	66 (55-750 MHz)	60 (5-15 MHz)
(over specified frequency range)			70 (16-40 MHz)
Hum Modulation @ 15 A	dB	56 (55-150 MHz)	50 (5-15 MHz)
(over specified frequency range)		59 (151-600 MHz)	58 (16-40 MHz)
		55 (601-750 MHz)	
Current Draw @ 24 V DC	Amps	1.37	0.09
Test Points (±0.5 dB)	dB	-20	-20
Interstage Equalizer (value - type)	dB	16.5 - fixed	N/A
Interstage Level Control (type)		AGC w/ manual temp backoff	N/A
Operational Gain (minimum) ^{4,9}	dB	37	19
Internal Tilt ³ (±0.5 dB)	dB	+12.5	0
Noise Figure ⁴ @ 54 MHz	dB	10.5	N/A
Noise Figure ⁴ @ 750 MHz	dB	10	N/A
Reverse Noise Figure ⁹	dB	N/A	10
Reference Output Level—High Freq.	dBmV	46 @ 750 MHz	35 @ 40 MHz ⁸
		44 @ 550 MHz	
Reference Output Level—Low Freq.	dBmV	36 @ 54 MHz	35 @ 5 MHz ⁸
Reference Output Tilt ²	dB	10	flat

Forward and Reverse Performance with Specified Channel Loading

	Units	Forward	Reverse
CW Channel Loading	NTSC	79 w/ digital ⁵	6
Composite Triple Beat ⁶	dB	70	92
Cross Modulation ⁷	dB	67	80
Composite Second Order ⁶ (high side)	dB	64	82

Delay Characteristics

Forward (Chrominance to Luminance Delay)		Reverse (Group Delay in 1.5 MHz BW)	
Freq. (MHz)	Delay (ns)	Freq. (MHz)	Delay (ns)
55.25 - 58.83	27	38.5 - 40.0	33
61.25 - 64.83	12	33.5 - 35.0	9
67.25 - 70.83	7	10.0 - 11.5	6
77.25 - 80.83	3	5.0 - 6.5	60

Notes:

- (1) Specifications are listed for a 2A-3 station with a jumper installed in the Aux signal director location.
- (2) Reference output tilt is specified as "CABLE" tilt (as opposed to "linear" tilt).
- (3) Down tilt, the effect of cable, is represented by a (-). Up tilt, the effect of equalization, is represented by a (+).
- (4) Forward gain and noise figure measured with 0 dB input EQ and 1 dB input pad.
- (5) "Digital" refers to 550-750 MHz loading with 33 QAM carriers at -6 dB levels relative to analog video carrier levels.
- (6) CTB and CSO measured using CW carriers, with spectrum analyzer as the measurement device.
- (7) X-Mod (@ 15.75 kHz) specified using 100% synchronous modulation and frequency selective measurement device.
- (8) Reverse output reference level with a 0 dB reverse output equalizer and factory selected reverse output pad.
- (9) Reverse gain and noise figure for station with 0 dB reverse input pad, 0 dB reverse output EQ, and factory-selected reverse output pad.

Unless otherwise noted, the above specifications reflect typical station performance at stated reference levels in the recommended operating configuration, including the input equalizer and reverse filters where applicable. Unless otherwise noted, specifications are based on measurements made in accordance with NCTA Practices for Measurements on Cable Television Systems using standard frequency assignments and are referenced to 68°F (20°C).

Type 2A-3 System Amplifier III — 5-40/52-750 MHz

Station Powering Data

System Amplifier III Type 2A-3		I DC	AC Voltage											
		(Amps)	90	85	80	75	70	65	60	55	50	45	40	35
	AC Current (A)	1.46	0.58	0.61	0.64	0.66	0.68	0.71	0.74	0.78	0.85	0.94	1.05	1.21
	Power (W)		39.9	39.9	39.9	39.5	39.3	39.1	39.1	39.1	40.2	39.7	39.6	39.7

Data is based on stations configured for 2-way operation.

ORDERING INFORMATION

Amplifier Module - 1 required

- # 573965 - Type 2A-3 amplifier module with AGC. AGC has 445.25 MHz pilot frequency and manual temperature backoff control.

Note: Amplifier module also comes configured with reverse amplifier, reverse combiner, 16.5 dB interstage EQ, interstage pad, output pads, 0 dB reverse output EQ, 40/51 diplex filters, and integrated power supply. Power supply has 30 V AC undervoltage lockout (40 V is field configurable).

Housing - 1 required (all have 15 amp capacity)

- # 564390 Uncoated 4-port housing without external test point access
- # 564391 Coated 4-port housing without external test point access
- # 545435 Uncoated 4-port housing with external test point access
- # 545436 Coated 4-port housing with external test point access

Required Accessories

- Plug-in Pads (attenuators):
 - 1 required for forward (1 input)
 - 3 required for reverse (2 inputs, 1 output)
 - 1 required for AGC only if Main port amplifier output level at pilot frequency is NOT 42 dBmV (AGC comes configured with a 5 dB pad, which is appropriate for 42 dBmV Main output level at pilot frequency).

Available in 0.5 dB steps from 0 to 20 dB. Order Model PP-* (* denotes pad value); specify value.

- Plug-in Forward Input Equalizer, 1 required. Available in 1.5 dB steps from 0 to 28.5 dB at 750 MHz. Order Model EQ750-* (* denotes equalizer value); specify value.
- Reverse Equalizer, Variable or Fixed, 1 required (reverse output), select one of either type:

Variable Reverse Equalizers

- #511075 1.5 to 4.5 dB at 40 MHz
- #511295 4.5 to 7.5 dB at 40 MHz
- #511298 7.5 to 12.0 dB at 40 MHz

Fixed Reverse Equalizers

Available in 1 dB steps from 1 to 12 dB at 40 MHz. Order Model EQ40S-* (* denotes equalizer value); specify value.

- Plug-in Signal Director for auxiliary output, 1 required:
 - #562406 Jumper
 - #562414 2-way Splitter
 - #562419 DC-8
 - #562420 DC-12

Optional Accessories

- #467351 230 V AC Crowbar Surge Protector
- Plug-in Cable Simulator. Simulates cable losses, creating tilt opposite that of Equalizers. Use in place of Forward Input Equalizer as needed to maintain proper output tilt in short spaced locations. Available in 1.5 dB steps from 1.5 dB to 12.0 dB cable loss at 750 MHz. Order Model CS 750-* (* denotes CS value); specify value.

Related Equipment

- #501111 Long Reach Test Point Adapter
- #276982 Reverse Injection Probe (3 dB insertion loss)
- #548771 Pad Insertion/Removal Tool

MECHANICAL SPECIFICATIONS

Housing Dimensions

17.3 in. L x 4.8 in. H x 7.8 in. D
438.3 mm L x 122.4 mm H x 198.7 mm D

Weight

Housing 9 lbs, 9 oz; 4.4 kg
Module 4 lbs, 13 oz; 2.2 kg

Specifications and product availability are subject to change without notice.

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Scientific-Atlanta, Inc. <http://www.sciatl.com>
United States: 4261 Communications Drive, P.O. Box 6850, Norcross, GA 30091-6850; Tel: 800-433-6222; Fax: 770-903-4617
Canada: 7725 Lougheed Highway, Burnaby, BC V5A 4V8; Tel: 604-420-5322; Fax: 604-420-5941
United Kingdom: Home Park Estate, Kings Langley, Herts WD4 8LZ, England; Tel: 44-923-266-133; Fax: 44-192-327-0448
Australia: Unit 2, 2 Aquatic Drive, P.O. Box 292, Frenchs Forest, NSW 2086, Australia; Tel: 61-2-9452-3388; Fax: 61-2-9451-4432
Singapore: 1 Claymore Drive, #08-11 Orchard Towers, Singapore 229594; Tel: 65-733-4314; Fax: 65-733-2706
Hong Kong: Suite 56 & 57, 5/F New Henry House, 10 Ice House Street, Central, Hong Kong; Tel: 852-2522-5059; Fax: 852-2522-5624